REMARKS

Reconsideration of the application as amended is respectfully requested.

Claims 1-5 and 13 stand rejected under 35 USC 102(a) as being anticipated by Pohl (5,182,458). Pohl shows a wind turbine with a pair of rotors that rotate about vertical axes. The Office Action points out that the rotors in Pohl are closely spaced and that they rotate in opposite directions. However, the rotors in the Pohl device operate on a principle of differential drag. The rotors each include a 3-corner polygon shaped structure. Each corner of the polygon includes a convex side (element 26 in Figure 5a) and a concave side (element 27 in Figure 5a). The convex sides of the corners of the polygon create lower aerodynamic drag than the concave sides. Therefore, as the wind blows across the rotors, there is a net differential drag force that causes the rotors to turn. Differential drag devices are very old and well known. The very earliest wind turbine recorded to have been used was a differential drag device similar to that of Pohl which was utilized to grind grain in ancient Persia. Differential drag devices are simple and robust, although their aerodynamic efficiency is quite low.

Claim 1 has been amended to recite that the wind turbine of the present invention utilizes "a lift-developing blade with an airfoil-shaped cross-section". The use of airfoil-shaped blades which operate on a principal of lift achieves significantly higher efficiency than the simpler differential drag rotor taught by Pohl. Placement of two rotors utilizing lift-developing blades within a distance of less than 3 times the rotor radius, as set forth in claim 1, provides additional aerodynamic efficiency. Therefore, the claimed device is different than the wind turbine taught by Pohl and achieves a higher efficiency. All of the other references that the Office Action cites also utilize differential drag rotors. Moreover, Pohl spends significant effort teaching a device that is optimized for a differential drag rotor, thereby teaching away from the claimed invention. Therefore, it would not have been obvious to one of ordinary skill in the art to have used a lift-developing blade with an airfoil shaped cross section on the wind turbine taught by Pohl.

Claims 1, 3-5 and 13 stand rejected under 35 USC 102(a) as being anticipated by Bourriaud (FR 0046122). Bourriaud shows a wind turbine with a plurality of rotors that rotate about vertical axes. The Bourriaud device spaces the rotors of adjacent rotors

relatively close to each other, although the rotors are separated by shrouds 1 which prevent aerodynamic interaction between adjacent rotors. The shrouds 1 of the Bourriaud device provide enhanced performance by concentrating the wind flow onto the rotors. The Bourriaud device utilizes blades that are convex on one side and concave on the other side as shown in Figure 4. This type of blade experiences higher aerodynamic drag in one direction than the other. This creates a differential drag force that provides motive force to the rotor. Therefore, the Bourriaud device can be classified as a differential drag type device similar to that taught by Pohl. Bourriaud cyclically pitches the blades to enhance the effect of differential drag forces. The shrouds 1 in the Bourriaud serve to enhance the differential drag forces even further.

The Bourriaud device is in contradistinction to the invention described in claim 1 which includes "a lift-developing blade with an airfoil-shaped cross-section". Moreover, the shrouds 1 in Bourriaud prevent "aerodynamic interaction between said wind turbines" to increase the efficiency thereof, as set forth in claim 1. The use of lift-developing blades with an airfoil-shaped cross-section, as set forth in claim 1, allows for very high aerodynamic efficiency, especially when the rotors are placed closer than 3 times the rotor radius so as to create aerodynamic interaction between the wind turbines to increase their efficiency. Therefore, the invention set forth in claim 1 is different than the wind turbine taught by Bourriaud. Bourriaud spends considerable effort to separate the aerodynamic effects of individual rotors from each other by placing shrouds 1 in between each pair of rotors. The aerodynamic separation of adjacent rotors utilized by Bourriaud teaches away from the claimed invention which recites aerodynamic interaction. Therefore, it would not have been obvious to one of ordinary skill in the art to have used a lift-developing blade with an airfoil shaped cross section on the wind turbine taught by Bourriaud, nor would it have been obvious to one of ordinary skill in the art to have placed rotors in the Bourriaud device so that they have aerodynamic interaction to increase their efficiency.

Claims 6 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Pohl or Bourriaud in view of Wells. Claims 6 and 7 are dependent upon claim 1 and applicant submits that they are allowable for the same reasons given above in relation to claim 1.

Claims 8-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Pohl or Bourriaud in view of Tackett. Claims 8-11 are dependent upon claim 1 and applicant submits that they are allowable for the same reasons given above in relation to claim 1.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Pohl or Tackett in view of Brammeier. Claim 12 is dependent upon claim 1 and applicant submits that it is allowable for the same reasons given above in relation to claim 1.

For the reasons set forth above, the applicant submits that claims 1-13 are non-obvious and are allowable.

For the foregoing reasons, applicant submits that the invention disclosed and claimed in the present application is not taught by any of the references of record, taken either alone or in combination. Therefore, applicant submits that allowance of the application is in order and is requested.

Respectfully Submitted,

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on June 17, 2003

John VandenBosche

Date of Signature June 17, 2003